Full-Field Imaging with Coherent Hard X-Rays

C. Rau[1,2], C. P. Richter[3], W. Liu[1], L. Fan[3] and I. K. Robinson[4]

[1]Advanced Photon Source, Argonne National Laboratory, 9700 S. Cass Ave., Argonne, IL, 60439, USA, [2]Frederick-Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, 104 South Goodwin Ave., Urbana IL, 61801, USA, [3]Northwestern University Feinberg School of Medicine, Department of Otolaryngology Head- and Neck Surgery, 303 E. Chicago Ave, Chicago, IL, 60611, USA, [4]Department of Physics and Astronomy, University College London, Gower Street, London WC1E 6BT, UK.

We report about full-field imaging with in-line phase contrast. The technique is applied to study the structure of a mammalian cochlea. The objective is to measure the motion patterns in a closed cochlea. This is in particular challenging, because soft (and low absorbing) tissue and strong absorbing structures, such as bone, are covering each other. In addition we report about recent imaging in cone-beam geometry using Kirkpatrick-Baez mirrors. The method has a strong potential for high-resolution and dose efficient imaging.